Joint MPH Program
University of Gondar and Addis Continental Institute of Public Health

Determinants of low birth weight in Addis Ababa: a case-control study

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A THESIS SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GONDAR, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN PUBLIC HEALTH

June 2009

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LIST OF ABBREVIATIONS

ANC	Antenatal Care
CSA	Central Statistical Authority
CI	Confidence Interval
DHS	Demographic and Health Survey
HIV	Human Immune-deficiency Virus
HSDP	Health Sector Development Program
IUGR	Intra Uterine Growth Restriction
LBW	Low Birth Weight
MDG	Millennium Development Goal
MUAC	Mid Upper Arm Circumference
OR	Odds Ratio
SNNPR	South Nations, Nationalities and People's Region
UNDP	United nations Development Program
UNICEF	United Nations Children Fund
WHO	World Health Organization

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ACKNOWLEDGEMENT

Foremost, I would like to express my deep and sincere gratitude to my advisors Dr. Haimanot Ambelu and Professor Yemane Berhane for their guidance, encouragement, and support from the initial proposal development to the final level of my thesis.

My sincere thank also goes to Dr. Alemayew Worku for his guidance in statistical analysis of this thesis.

I am also grateful to Addis Continental Institute of Public Health and University of Gondar for their concerted efforts in opening up MPH program and offering me with an opportunity to pursue my study.

Addis Ababa City Administration Health Bureau and Gandhi Memorial Hospital are acknowledged for giving permission to conduct the study. Cooperation of all staff of Gandhi Memorial Hospital is also highly acknowledged.

I am indebted to all mothers who participated in the study, who devoted their time and provided valuable information.

I wish to express my heartfelt gratitude to my fiancée Hana Denbi for her continuous support, encouragement throughout my study. Special thanks to my brothers Dr. Getahun Bero and Deneke Bero for their help in numerous ways.

Dedication

This thesis is dedicated to my fiancée Hana Denbi who has been a great source of motivation and inspiration.

ABSTRACT

Background: Low birth weight is a widely used indicator of newborn health. It is closely associated with fetal and neonatal mortality and morbidity, inhibited growth and cognitive development, and chronic diseases later in life. Determinants of low birth weight were not much studied in Ethiopia. It is expected that, identification of LBW determinants could enhance its reduction and its immediate and long term consequences.

Objective: The objective of the study is to identify determinants of low birth weight in Addis Ababa.

Methods: the study was conducted in Gandhi Memorial Hospital, Addis Ababa, Ethiopia. A case-control study design was employed. The cases were infants born with low birth weight while the controls were unmatched normal weight babies born at the same hospital during the same period as the cases. Only singleton live births whose parents were residing in Addis Ababa were included in the study. Data were collected through a face to face maternal interviews using pre-tested structured questionnaire and reviewing records. Bi-variate and multivariate logistic regression were employed in order to infer associations and predictions.

Results: Data were obtained for 408 babies. On multivariate logistic regression analysis, four variables achieved a level of statistical significance predicting LBW: preterm birth (<37 weeks of gestation), maternal weight of <60 Kg in the last month of pregnancy, maternal history of hypertension during pregnancy and antenatal care under-attendance (1 to 3).

Conclusion: Maternal hypertension during pregnancy, maternal weight of less than 60Kg during last month of pregnancy and under attendance of prenatal care (1-3 visits) resulted in higher occurrence of LBW. The importance of short gestation/preterm birth/ as a determinant of LBW was also clearly supported by the current finding.

Recommendation: Early detection and management of hypertension during antenatal care follow-up was recommended. Nutrition interventions for women to attain a weight of 60Kg, proper prenatal care needs to be promoted and delivered for all pregnant mothers. Additionally, further study on determinants of preterm birth and barriers of ANC follow up were suggested.

1. INTRODUCTION

The period of intrauterine growth and development is one of the most vulnerable in the human lifecycle. Infants born with low birth weight (LBW) suffer from extremely high rates of morbidity and mortality from infectious disease, underweight, stunting or wasting beginning in the neonatal period through childhood. LBW is also associated with impaired immune function and poor cognitive development for neonates and infants. Moreover, evidence now shows that adults born with LBW face an increased risk of chronic diseases including high blood pressure, non-insulin dependent diabetes mellitus, epilepsy, asthma, myocardial infarction, and stroke in adulthood (1-5). LBW was also found to result with low school performance (6). Although low-birth weight babies constitute only about 14% of children born, they account for 60–80% of neonatal deaths (7). A study in Ethiopia showed that mortality in infants weighing less than 2500 gm was several times higher than in those weighing above 2500 gm and LBW was also responsible for 17 % of neonatal mortality (8,9). Low birth weight is an intergenerational problem in which low birth weight infants grow up to be undernourished and stunted children and adolescents and, ultimately, undernourished women of childbearing age, and undernourished pregnant women who themselves deliver low birth weight infants (1).

Low birth weight arises through short gestation (preterm birth) or in-utero growth restriction, or both (1,7). The majority of LBW in developing countries is due to intrauterine growth restriction (IUGR), while most LBW in industrialized countries is due to preterm birth (7).

Previous researches have shown that LBW is influenced by socioeconomic status, educational status of the mother, birth order of the child (parity), maternal perceived health status, maternal nutritional status, dietary vitamin C intake during pregnancy, maternal age, gestational age at

delivery, antenatal care (ANC) attendance & number of visits, maternal alcohol intake, maternal anemia, maternal smoking, maternal caffeine intake, maternal infections, marital status, place of residence (urban or rural), depression during pregnancy, chronic diseases and domestic violence (10-22).

The incidence of LBW is included as an indicator in the targets of the millennium development goals, as an optional indicator in goal one 'to eradicate extreme poverty and hunger' (23). The reduction of low birth weight forms an important contribution to the millennium development goal (MDG) for reducing child mortality. Activities towards the achievement of the MDGs will need to ensure a healthy start in life for children by making certain that women commence pregnancy healthy and well nourished, and go through pregnancy and childbirth safely. Low birth weight is therefore an important indicator for monitoring progress towards this internationally agreed-upon goal (23).

Demographic and Health Survey (DHS) 2005 has found the prevalence of LBW in Ethiopia to be 14% (10). Hospital based studies in Addis Ababa and Gondar have found the prevalence of 17.8% and 8.4% respectively (9,23). Furthermore, according to DHS 2005 the percentage of low birth weight babies has increased from 8 percent in 2000 to 14 percent in 2005. A study made in Addis Ababa hospital showed a similar increasing trend through time; the proportion of LBW in 1970's, 1980's, 1990's were 5.8%, 7.1 & 11.3 respectively (24).

Determinants of LBW were not much studied in Ethiopia. Institutional records were major sources of data for most of the few studies conducted previously. There are two main challenges while using institution based data for such studies. The first is that such data tend to be

incomplete and inaccurate. Besides, only few variables could be obtained from such records: limiting analysis of different factors for LBW and control for confounders. Furthermore, many of these studies were descriptive or crude. A detailed case-control study of determinants of LBW in an urban setting of Ethiopia was therefore, done. Identification of determinants of LBW is essential in order to guide program planning, and organizing care for mothers and their newborns. It is expected that identification of these determinants will enable to reverse the increasing trend of LBW in Ethiopia and thereby it's immediate and long term consequences.

2. REVIEW OF LITERATURES

Birth weight is the first weight of the fetus or newborn obtained after birth & should preferably be measured within the first hour of life before significant weight loss has occurred. Low birth weight has been defined by the World Health Organization (WHO) as weight at birth of less than 2,500 grams (5.5 pounds) (25). This practical cut-off for international comparison is based on epidemiological observations that infants weighing less than 2,500 gm are approximately 20 times more likely to die than heavier babies (26).

Low birth weight has long been used as an important public health indicator. Globally, the indicator is a good summary measure of a multifaceted public health problem that includes long-term maternal malnutrition, ill health, hard work and poor pregnancy health care. On an individual basis, low birth weight is an important predictor of health; efforts must therefore go into measuring it as accurately as possible at birth and organizing and planning infant care accordingly (26).

According to International statistical classification of diseases and related health problems, tenth revision LBW can be classified under three categories: -

- Low birth weight is defined as less than 2,500 g (up to and including 2,499 g).
- Very low birth weight is less than 1,500 g (up to and including 1,499 g),
- Extremely low birth weight is less than 1,000 g (up to and including 999 g).

The definitions of ‘low’, ‘very low’, and ‘extremely low’ birth weight do not constitute mutually exclusive categories (25).

Globally 18 million babies are estimated to be born with low birth weights every year (7). More than 95 per cent of low birth weight babies are born in developing countries. The number of low birth weight babies is concentrated in two regions of the developing world: Asia and Africa. Low birth weight levels in sub-Saharan Africa are around 13 per cent to 15 per cent, with little variation across the region as a whole (26).

WHO and United Nation Children Fund (UNICEF) 2004 estimated that in the developing world as a whole, more than half (58%) of births are not weighed. Moreover, the percentage of infants births not weighed at birth in the year 2000 was 96% in Ethiopia (26,27). This makes analysis of trends in low birth weight difficult because of the lack of comparability of estimates between countries and within countries over time.

According to DHS 2005 the prevalence of LBW in Ethiopia is 14% (10). Other hospital based studies in Addis Ababa and Gondar have found prevalences of 8.4% and 17.8% respectively (14, 23). Comparison of DHS 2000 and 2005 show that the percentage of low birth weight babies in Ethiopia has increased from 8 percent in 2000 to 14 percent in 2005. Furthermore, the percentage of babies assessed by mothers as being very small at birth has increased over the same period from 6 percent to 21 percent (10). Hospital based study made in Addis Ababa showed a similar increasing trend through time; the proportion of LBW in 1970's, 1980's, 1990's were 5.8%, 7.1 & 11.3 respectively (23).

3.1.Causes and factors associated with LBW

A baby's low weight at birth is either the result of preterm birth (before 37 weeks of gestation) or of restricted fetal (intrauterine) growth (1,7,26). Many factors affect the duration of gestation and of fetal growth, and thus, the birth weight. They relate to the infant, the mother or the physical

environment and play an important role in determining the infant's birth weight and future health. The major risk factors identified by previous researchers of LBW are discussed below.

Maternal age: A great deal of debate has focused on whether increased maternal age is an independent risk factor or only acts as a risk factor in the presence of other factors. In Gondar association of LBW with maternal age was shown, the incidence of LBW being higher among young mothers (<20 years) (16). DHS 2005 Ethiopia found birth weight being lower among children born to older women (age at birth 35-49) (10). Another study in Jimma found that there was a tendency of increase in birth weight as maternal age increases up to 34 years and then to decrease (15). Studies conducted in Europe, United Arab Emirates, India and Pakistan have similarly shown higher proportions of LBW at younger maternal ages (19,20,28-30). In India, it was found that young maternal age (<18 years) increased risk of preterm delivery (31). Other researchers, which have adjusted for other social factors argue that young maternal age is not an independent factor for LBW (15,19,21,32-34). Studies in Egypt and India depicted advanced maternal age (over 35 years) to be associated with occurrence of LBW (34-36).

Marital Status: Studies have shown that single mothers face many times as much risk of having LBW deliveries compared to the married ones (14, 37, 38). However, in some studies in which other factors have been held constant, birth weight was not significantly different between the infants of married and unmarried women (21, 39).

Family Income: Edris et al 1996, found that family income affects the chance of having LBW infant (14). A systematic review of literatures in UK found income influencing LBW (40). In Pakistan income was not found to influence birth weight (12,20).

Maternal Education: DHS Ethiopia 2005 has found that lower birth weight is higher in children of women with no education (10). Other studies in Italy, India, Iran, and Tanzania showed

similar results (21,28, 32, 38). Other studies, which have adjusted for other socioeconomic conditions, did not find its association with LBW (33, 42).

Parity (Birth order of a child): Studies in Gondar hospital and Sidamo regional hospital have demonstrated higher proportion of LBW among primi-parous than multi-parous (16,17). Studies in other countries have found similar results (29,30,32,34,39). A study in Pakistan found that women who were pregnant for the first time or had given birth five or more times were more likely to give birth to an LBW infant (37). Other studies done in Spain and United Arab Emirates found similar results (19, 22). DHS Ethiopia 2005 found lower birth weight in children at higher birth orders (6 and above) (10).

Maternal weight during pregnancy: Maternal nutritional status is another factor that is found to be associated with LBW delivery. A study in Central African Republic found that the mother's long-term nutritional situation, represented by maternal weight, was the most important determinant of birth weight, while the short term nutritional situation, represented by gestational weight gain, was less important (40). Endris et al 1996 found maternal weight on admission for delivery was found to be associated with the occurrence of LBW (14). Similarly, study in Spain found that weight gain during pregnancy and body size (mainly maternal pre-pregnancy weight) was associated with LBW (22)

Prenatal care: Antenatal attendance is considered to have a protective effect against LBW (14). A study in Pakistan showed that mothers who had one or no prenatal care visits during pregnancy were twice as likely to give birth to an LBW infant as mothers who had four or more visits (12). Additionally, weeks of gestation at first prenatal visit, numbers of total visits were

also found to affect risk of delivering LBW infant (21,43). Another study similarly found ANC under- and non-attendance poses a higher risk of delivering LBW (46).

Hypertension : Hypertension of all types is most strongly associated with LBW(22, 35, 37, 38, 42, 47). Hypertension in pregnancy is not a single entity. It includes disorders such as gestational hypertension, pre-eclampsia, eclampsia, and chronic hypertension (47). Hypertension causes blood vessel stenosis in some pregnant women and results in LBW in infants (42). Biological mechanisms have been suggested to explain the link between pregnancy induced hypertension and LBW. In a normal pregnancy, the trophoblast cells invade the decidualized endothelium and the inner third of the myometrium. This invasion serves to anchor and connect the placenta with the maternal vascular system. In pregnancy induced hypertension or preeclampsia, it is postulated that the trophoblast invasion into the spiral arteries that supply the placenta is incomplete. Because of the decreased uretroplacental blood perfusion, this leads to intrauterine growth retardation and low birth weight (47).

Smoking and caffeine intake: Maternal cigarette smoking during pregnancy or exposure to tobacco smoke was also found to be associated with delivery of LBW infant (21). Another study also came up with the result that caffeine intake during pregnancy was associated with an increased risk of fetal growth restriction and thereby LBW (18). Another study in United States debated that caffeine had no effect on low birth weight (48).

Sex of child: Previous researchers have shown that sex of a child is a factor that can influence birth weight. In a study at Sidamo regional hospital, it has been shown that the risk of LBW in female is higher than for male infants (17). A study in Gondar and Jimma showed similar result (15,16,37).

Domestic violence: Domestic violence was shown to be an independent factor for LBW (13,45). The relation between adverse outcome of pregnancy and abuse during pregnancy may occur through direct and indirect mechanisms. Direct mechanisms involve trauma to the pregnant abdomen leading to premature labour, rupture of membranes, placental abruption or a ruptured uterus. Indirect mechanisms may stem from the abusive environment. Abuse during pregnancy has been associated with low socioeconomic status, poor maternal weight gain, anemia, an unhealthy diet, sexually transmitted diseases and psychological morbidity. These variables, as well as stress and lack of social support, have been identified as risk factors for LBW

Preterm birth (short gestation): As one expects, Edris et al. 1996 found an association between LBW and gestational age of below 37 completed weeks (14). Studies in Pakistan and Italy also came up with similar results (20, 21).

Other factors: anemia during pregnancy, previous history of abortion, caesarean section delivery, twin or multiple birth, short inter-pregnancy interval of 3 months or less were also found to increase risk of LBW delivery (19-21)Vaginal bleeding during pregnancy was also another factor known to be associated with LBW (20,22).

3. OBJECTIVE

The objective of the study is to identify determinants of low birth weight in Addis Ababa.

4. METHODS AND MATERIALS

4.1. Study setting

The study was carried out in Gandhi memorial Hospital, Addis Ababa, Ethiopia. This government hospital was established in 1955 and it serves as a teaching hospital for Addis Ababa University with a capacity of 101 beds. The hospital owns a total 247 staff with 4 Gynecology/Obstetrics specialists, 2 general practitioners and about 87 nurses/midwives. The services rendered in the hospital include delivery, outpatient and inpatient obstetric and gynecologic, HIV counseling and testing, prevention of mother-to-child transmission of HIV/AIDS, anti-retroviral treatment, family planning and vaccination. Each day about 180-200 clients receive these services with delivery service comprising about 24-30 a day. The hospital also serves as a referral hospital receiving obstetrics and gynecology cases transferred from all health centres in Addis Ababa. The good number of delivery services rendered was considered in selection of the hospital for study.

4.2. Study design

A case-control study design was employed.

4.3. Study participants

The cases consisted of babies born in Gandhi memorial hospital with a birth weight of less than 2500 grams. The controls were unmatched normal-weight (≥2500 grams) babies born at the same hospital during the same period as the cases.

Criteria for including a baby in the study were as follows:

a. Singleton live births
b. Parents residing in Addis Ababa and,
c. The mother gave verbal consent to inclusion.

Exclusion criteria from the study were:-

a. Still births
b. Multiple births
c. Parents residing out of Addis Ababa and,
d. Mother not willing to participate in the study.

4.4. Sample size and Sampling strategies

ANC attendance, parity, gestational age, maternal age of <20 were considered in order to calculate the required sample size. As it can be seen from Table 1 below, ANC attendance yielded the largest sample size. For practical reasons, a control to case ratio of 2:1 was taken.

Using Epi-info statistical software package, based on the variable ANC attendance which is 88% among mothers of normal weight babies in Addis Ababa, with a 95% confidence interval (CI), taking a control to case ratio of 2:1, with odds ratio (OR) of 0.5 (protective); the required sample size became *193* low birth weight newborns (cases) and *386* norm

al weight newborns (controls).

Table 1: Sample size determination for the study on determinants of low birth weight in Addis Ababa, Ethiopia, June 2009

S. No	Variable/factor	Confidence Interval	Power	exposure in Normal weight (source of data)	OR	Control to case ratio	Sample size		
							Controls	Cases	Total
1	ANC attendance	95%	80%	88% (DHS 2005 for AA)	0.5	2:1	386	193	579
2	Maternal age <20	95%	80%	17% (DHS 2005, National)	2	2:1	302	151	453
3	Preterm (<37 weeks gestation)	95%	80%	18 % (Study in Gondar)	2	2:1	292	146	438
4	Parity (1^{st} birth order)	95%	80%	40% (study in Black lion hospital)	2	2:1	214	107	321

Selection of Cases: All LBW newborns, meeting the inclusion criteria, were included in the study.

Selection of Controls: Two normal weight babies born next to newborns of LBW and meeting the inclusion criteria were included in the study. Non respondents were replaced by the next cases/controls registered.

4.5.Data collection and Data quality

Data collection was undertaken from March 01 through May 31, 2009. Data were collected through face to face maternal interview and medical record reviews. Weights of newborns' were taken from the record book of the hospital. At the hospital, midwives/nurses or doctors weigh babies using spring scale within the first few minutes following delivery. Gestational age was calculated from last menstrual period of the mother. Interviews were made using structured questionnaire, prepared in English and translated into Amharic. In the hospital mothers are not weighed up on admission or after delivery.

In the hospital it is customary to retain mothers for at least 6 hours after delivery. Discharges from the hospital usually take place at about 8:30 AM in the morning and at around 3:30 PM. Therefore, interviews with the mothers were completed every day before these specified times.

In order to assure the quality of data the following measures were undertaken:-

- The majority (about 84%) of the data were collected by the principal investigator,
- The rest of the data were collected by a nurse working for the hospital. The nurse was oriented on the questionnaire and techniques of data collection,
- Pre-testing was done on about 12% of the total sample size in the same hospital during the training of the data collector after which skip patterns and other minor changes were made to the questionnaire.
- The Principal investigator has reviewed all filled questionnaires,
- Regular supervisions were made and some of the data collected by the nurse were checked by re-interviewing mothers.

4.6. Data Analysis

Data were coded, entered and cleaned using EPI-INFO version 3.5.1 (CDC, Atlanta, USA) and exported to SPSS version 15.0 for windows (SPSS Inc, Illinois, Chicago, USA) statistical software package for statistical analysis. Data were summarized and described using cross tabulations. Bi-variate and multivariate logistic regression analysis with 95% confidence interval were employed in order to infer associations and predictions.

Initially, each variable was entered into a logistic regression model as the only independent variable with LBW being a dependent variable (i.e. crude Odds ratio was calculated for each exposure variable).

Finally, variables that emerged statistically significant under bi-variate analysis at 90% confidence interval were entered in to a multiple logistic regression model in order to identify independent predictors for LBW.

Variables in the study

- The outcome (dependent) variable of the study was Low birth weight,
- The main exposure variables were Socio-demographic factors, newborn's characteristics, maternal obstetric history, maternal health conditions, and maternal life-style/personal habits during pregnancy.

4.7. Definitions of terms

- **Preterm**: - is an infant born before 37 completed weeks of gestational age.
- **Domestic violence**- any act or conduct that results in, or is likely to result in, physical, sexual or psychological harm or suffering to a woman by intimate partner with in household.
- **Low birth weight: -** is a weight of newborn baby measured with in 1 hour of delivery and is less than 2500 g.
- **Gestational age**: - gestational age of the fetus is the elapsed time since conception and is measured from the first day of the last menstrual period.
- **Parity: -** The number of full term children previously borne by a woman, excluding miscarriages or abortions in early pregnancy, but including stillbirths.
- **Gravidity: -** The number of pregnancies (completed or incomplete) experienced by a woman.

4.8. Ethical Consideration

University of Gondar research and publication office has provided ethical clearance and approval for the study. The study has also received ethical clearance from Addis Ababa City Health Bureau. Permission was obtained from Gandhi memorial hospital.

The objective of the study was thoroughly explained to the study participants and oral informed consents were obtained from all mothers of newborns participating in the study. Furthermore, the questionnaires were anonymous and confidentiality was strictly maintained. As a result, there was no known risk posed by the study to the study participants. Health educations were given to mothers at the end of the interview on child care and modifiable factors affecting birth outcomes.

5. RESULTS

Data were obtained for a total of 408 babies: 136 were LBW babies and 272 were babies with a normal weight. There were eight non respondents. The reasons cited for non participation were concern about baby's health, death of a child, dissatisfaction with the service of hospital and not being in a good mood and health state at the time of interview.

5.1. Sex distribution of newborns

Among the 136 cases the male: female ratio was 1:1.125, and among the 272 controls the male: female ratio was 1.16:1 (table 2).

Table 2: Sex distribution of newborns participating in the study, Addis Ababa, Ethiopia, June 2009 (n=408)

	Cases (Low birth weight)		Controls (normal weight)	
Variable	Number	Percentage (%)	Number	Percentage (%)
Sex of newborn				
Female	72	52.94	126	46.32
Male	64	47.06	146	53.68

5.2. Socio-demographic characteristics of parents

Table 2 presents socio-demographic characteristics of parents of babies included in the study. Nine (6.6%) and 5 (1.84%) of the mothers of LBW and normal weight babies respectively were under 18 years of age. Besides, 7 (5.15%) and 7 (2.57%) of the mothers of low birth weight and normal babies respectively were above 34 years of age. The rest majority, 120 (88.24%) mothers of the cases and 260 (95.59%) mothers of the control babies were in age category of 18-34 years.

Twenty five (19%) mothers of the cases and 37 (14%) mothers of controls did not attend any form of formal education. Higher percentages of mothers of normal weight babies (25%) attained an educational level of above grade 10 compared to mothers of low birth weight babies (16%). Majority of mothers of the cases (67%) and controls (63%) were Orthodox Christians, followed by Muslims comprising about one fifth in each category (21.48% and 20.6% respectively).

Nearly half of mothers of the cases (48.15%) and controls (49.26%) were not employed for cash (students/housewives/unemployed), while 20 (15%) mothers of cases and 43 (8.5%) mothers of controls were unskilled laborers. Fairly higher percentage of mothers of normal weight babies (39%) were employed for cash (Government/NGO/Private sectors/self employed) than mothers of low birth weight babies (32.6%). The overwhelming majority of mothers of cases (86.5%) and controls (90.8%) were currently married or living together.

Over four fifth of the fathers of cases (83.5%) and controls (88%) were employed for cash. A greater percentage of fathers of normal weight babies attained an educational level of above grade 10 (47.7%) compared to fathers of low birth weight babies (38%).

Information on monthly family income was obtained from mothers participating in the study and it was put under three equal categories. The income distribution was similar in families of cases and control.

Table 3: Socio-demographic characteristics of parents of study participants, Addis Ababa, Ethiopia, June 2009 (n=408)

	Cases		Controls	
Parent characteristics	Number	Percentage (%)	Number	Percentage (%)
Age of mother				
<18 years	9	6.62	5	1.84
18-34 years	120	88.24	260	95.59
>34 years	7	5.15	7	2.57
Educational level of mother				
No education	25	18.52	37	13.65
Elementary (Grade 1-6)	41	30.37	75	27.68
Junior (Grade 7-10)	48	35.56	90	33.21
>10th Grade	21	15.56	69	25.46
Religion of mother				
Orthodox	91	67.41	170	62.73
Protestant	13	9.63	38	14.02
Muslim	29	21.48	56	20.66
Others	2	1.48	7	2.58
Mother's occupation				
Not employed for cash*	65	48.15	134	49.26
Employed for cash†	44	32.59	106	38.97
Unskilled labourer	20	14.81	23	8.46
Others	6	4.44	9	3.31
Paternal occupation				
Employed for cash‡	96	83.48	210	88.24
Unskilled labourer and unemployed	14	12.17	23	9.66
Others	5	4.35	5	2.10
Marital status				
Married/Living together	115	86.47	247	90.81
Currently not married§	18	13.53	25	9.19
Educational level of father				
<7th Grade	30	27.78	48	20.08
Junior (Grade 7-10)	37	34.26	77	32.22
>10th Grade	41	37.96	114	47.70
Monthly family income (Ethiopian Birr)				
<550	40	35.09	78	31.84
550-1049	37	32.46	84	34.29
≥1050	37	32.46	83	33.88

* Not employed for cash (Student/Housewife/Unemployed)
† Employed for cash (NGO/GO/Private/Self employed)
‡ Employed for cash (NGO/GO/Private/Self employed or skilled labourer)
§ currently not married (single, widowed, divorced, and separated)

5.3. Analysis of association of low birth weight with independent variables

The chance of being low birth weight between female and male babies was not different (Crude Odds Ratio (OR) =1.3, Confidence Interval (CI): 0.86, 1.97).

Table 4: Association of sex of study participants (babies) with low birth weight, Addis Ababa, Ethiopia, June 2009 (n=408)

Characteristics	Number of Cases	Controls	Crude OR (95% CI)
Sex of newborn			
Female	72	126	1.30 (0.86, 1.97)
Male	64	146	1.00

The chance of delivering LBW baby is nearly 4 times (Crude OR=3.9, CI: 1.28, 11.89) higher in mothers of under 18 years compared to mothers of 18-34 years of age. However, this association was not significant under multiple logistic regression analysis (Adjusted OR=1.08, CI: (0.11, 10.57). Similarly, mothers above 34 years of age had over three-fold chance of delivering LBW baby than mothers in age category of 18-34 years, even though this difference was not statistically significant (adjusted OR=3.44, CI: (0.52, 22.64).

Analysis of association of different educational levels of mothers with LBW was employed taking those who have attained an educational level of above grade 10 as a reference category. The odds of delivering an LBW baby among mothers with no education, with educational level of grade 1-6 and grade 7-10 were respectively 2.22, 1.75, and 1.8 times more than the reference mothers. However, only non attendance of formal education attained a significant association with LBW (crude OR=2.22, CI: 1.1, 4.49) and later failed to show association under multiple logistic regression analysis (adjusted OR=0.46, CI: 0.08, 2.64).

A mother's religion did not have significant association with LBW. Regarding maternal occupation, the odds of delivering LBW among unskilled laborers is 2 times higher than those who were employed for cash**.** However, this association was not observed under multiple logistic regression (adjusted OR=1.57 CI: 0.42, 5.9). No statistically significant association was observed between LBW and mothers who were not employed for cash (crude OR=1.17, CI: 0.74, 1.85). Mothers who were currently not married (never married/divorced/widowed) had over one and half times chance of delivering LBW baby compared to currently married ones. However, the difference was not statistically significant (crude OR=1.55, CI: 0.81, 2.95).

The odds of LBW among fathers with educational level of below grade 7 was 1.7 times higher than those who attained educational status of above grade 10 (OR=1.74, CI: 0.97, 3.10) even though this association did not attain a level of statistical significance. Alike the educational level of father, paternal occupation also did not show a statistically significant association with LBW (table 4).

Table 5. Association of Socio-demographic characteristics of parents of babies with LBW, Addis Ababa, Ethiopia, June 2009 (n=408**)**

Variable	Number of Cases	Controls	Crude OR (95% CI)
Age of mother			
<18 years	9	5	**3.90 (1.28, 11.89**)
18-34 years	120	260	1.00
>34 years	7	7	2.17 (0.74, 6.32)
Educational level of mother			
None	25	37	**2.22 (1.10, 4.49)**
Elementary (Grade 1-6)	41	75	1.80 (0.97, 3.34)
Junior (Grade 7-10)	48	90	1.75 (0.96, 3.20)
>10th Grade	21	69	1.00
Religion of mother			
Orthodox	91	170	1.00
Protestant	13	38	0.64 (0.32, 1.26)
Muslim	29	56	0.97 (0.58, 1.62)
Others	2	7	0.53 (0.11, 2.62)
Mother's Occupation			
Not employed for cash**	65	134	1.17 (0.74, 1.85)
Employed for cash††	44	106	1.00
Unskilled labourer	20	23	**2.09 (1.05, 4.20)**
Others	6	9	1.61 (0.54, 4.78)
Marital status			
Married/Living together	115	247	1.00
Currently not married	18	25	1.55 (0.81, 2.95)
Educational level of father			
< Grade 7	30	48	1.74 (0.97, 3.10)
Junior (Grade 7-10)	37	77	1.34 (0.79, 2.27)
>10th Grade	41	114	1.00
Paternal occupation			
Employed for cash‡‡	96	210	1.00
Unemployed/Unskilled labourer	14	23	1.33 (0.66, 2.70)
Others	5	5	2.19 (0.62, 0.73)
Monthly family income (Ethiopian Birr)			
<550	40	78	1.15 (0.67,1.98)
550-1049	37	84	0.99 (0.57,1.71)
≥1050	37	83	1.00

** Not employed for cash (Student/Housewife/Unemployed)

†† Employed for cash (NGO/GO/Private/Self employed)

†† currently not married (single, widowed, divorced, and separated)

‡‡ Employed for cash (NGO/GO/Private/Self employed or skilled labourer)

Mothers who were pregnant for the first time were over one and half times more likely to deliver LBW than mothers with two to four pregnancies. The difference observed was also statistically significant (crude OR=1.57, CI: 1.03, 2.39). Moreover, mothers with five or more pregnancies had about one and half times chance of delivering LBW than mothers with two to four pregnancies, though this association was not statistically significant (crude OR=1.46 95% CI 0.41, 5.18). Similarly, first babies had one and half times chance of being LBW compared to babies with birth order of 2-4. However, the difference was not found to be statistically significant in both bi-variate and multivariate analysis. Previous history of abortion was also not found to have association with LBW delivery.

Gestational age was found to be the strongest predictor of LBW. The odds of being LBW in babies born before gestational age of 37 weeks is over seven and half times that of babies with gestational age of 37 weeks or more (adjusted OR= 7.65, CI: 2.79, 20.96).

Mothers were asked whether they were weighed during their recent pregnancy and if weighed, their very recent weight and time of measurement. Weight of a mother during the last month of pregnancy was also found to be independently associated with LBW delivery. It was found that mothers with body weight of less than 60 kg within the last month of pregnancy had over 2 times chance of giving birth to LBW baby than mothers with body weight of 60 kg or above during the same period (adjusted OR=2.31, CI: 1.06, 5.05).

Antenatal care attendance was found to be strongly and negatively associated with LBW. The odds of delivering LBW among mothers with no ANC follow up was about 9 times that of mothers who attended ANC at least once, and this difference was statistically significant (crude OR=9.08, CI: 2.97, 27.7). Further analysis among mothers who had ANC attendance yielded the

number of ANC visits to be an independent factor associated with birth weight. The odds of delivering LBW was about 2.5 times more likely in mothers with ANC visits of 1 to 3 than mothers with four or more ANC visits (adjusted OR= 2.88, CI: 1.14, 7.37). Unlike number of ANC attendance, pregnancy trimester at first ANC visit was not found to be associated with low birth weight delivery.

Maternal history of hypertension during current pregnancy was also an important independent factor found to be associated with LBW. Mothers with history of hypertension during their current pregnancy were found to have over 4 times chance of delivering LBW baby than mothers with no such history (adjusted OR=3.89, 95% CI: 1.59, 9.55).

Mothers were inquired whether they were diagnosed to have anemia by a health professional during their recent pregnancy. Mothers with history of anemia during their recent pregnancy were not found to have statistically different chance of delivering LBW baby than mothers with no anemia (OR=0.87, CI: 0.54, 1.36).

Vaginal bleeding during pregnancy was found to be associated with low birth weight. It was found that the odds of LBW was about 2 times more likely in mothers with history of vaginal bleeding during their recent pregnancy than mothers with no such history (crude OR=1.92, 95% CI: 1.03, 3.61). Under multiple logistic regression analysis the association lost significance (adjusted OR=1.04, 95% CI: 0.30, 3.63).

Maternal history of trauma during their recent pregnancy was not found to be associated with low birth weight delivery (OR=1.07, 95% CI: 0.56, 2.04). Domestic violence was assessed among the interviewed mothers. All forms of domestic violence: sexual, physical, psychological/emotional were assessed using five questions. Respondents were asked if they

ever faced any form of domestic violence during their recent pregnancy. If the respondent answered "yes" its frequency was also enquired. However, domestic violence was also not shown to have association with LBW.

Table 6: Association of maternal conditions during pregnancy with LBW in Gandhi Memorial Hospital, Addis Ababa, Ethiopia, June 2009, N=408

Variable	Number of Cases	Controls	Crude OR (95% CI)
Gestational age			
Preterm (<37 weeks)	44	14	11.58 (5.91, 22.69)
Term (≥37)	54	199	1.00
Weight of mother in the last month of pregnancy (kg)			
<60	31	54	2.17 (1.21, 3.86)
≥60	35	132	1.00
ANC follow up			
Yes	118	268	1.00
No	16	4	9.08 (2.97, 27.76)
Number of ANC follow up			
1-3	42	37	3.51 (2.10, 5.88)
≥4	73	226	
Pregnancy trimester at first ANC visit			
1st trimester	34	67	1.00
2nd trimester	66	152	0.86 (0.52, 1.42)
3rd trimester	13	39	0.66 (0.31, 1.39)
History of Hypertension during pregnancy			
Yes	38	30	3.47 (2.02, 5.93)
No	87	238	
History of Anemia during pregnancy			
Yes	40	95	0.87 (0.54, 1.36)
No	83	171	1.00
History of diabetes mellitus during pregnancy			
Yes	2	3	1.47 (0.24, 8.93)
No	120	265	1.00
Vaginal bleeding during pregnancy			
Yes	21	24	1.93 (1.03, 3.61)
No	112	247	1.00
History of trauma during pregnancy			
Yes	16	31	1.07 (0.56, 2.04)
No	115	239	1.00
Domestic violence during pregnancy			
Yes	19	51	0.75 (0.42, 1.32)
No	89	183	1.00

Mothers were also asked for intake of caffeine containing foods and drinks like tea, coffee and soft drinks (Cola) with the frequency of intake. No significant difference was observed among mothers who were taking caffeine and who never consumed caffeine during their pregnancy.

Mothers were categorized based on frequency of alcohol use during their recent pregnancy as those taking alcohol regularly (at least once a week), occasionally (at most once in 2 weeks) and not taking alcohol at all. However, there were no significant differences between the different levels of alcohol consumption.

Only a small number of respondents indicated chewing khat (twelve), using shisha (eight) and smoking cigarettes (one) during their recent pregnancy. As a result statistical tests were not employed for these variables. Passive smoking was also not found to have significant association with LBW (OR=0.77, 95% CI: 0.38, 1.55) (Table 6).

Table 7: Association of life style/substance use during pregnancy with LBW, Gandhi Memorial Hospital, Addis Ababa, Ethiopia, June 2009 (n=408)

Variable	Number of Cases	Number of Controls	Crude OR (95% CI)
Consumption of Caffeine containing food/drinks			
Not at all	11	20	1.00
Regularly (at least once a week)	111	242	0.83 (0.39, 1.80
Occasionally (at most once in 2 weeks)	11	8	2.50 (0.78, 8.06)
Maternal Alcohol consumption during pregnancy			
Not at all	64	125	1.00
Regularly (at least once a week)	16	39	0.80 (0.42, 1.54)
Occasionally (at most once in 2 weeks)	52	107	0.95 (0.61, 1.49)
Passive Smoking during pregnancy			
Yes	12.00	31	1.00
No	121	241	0.77 (0.38, 1.55)

Table 8: Summary of results of Multivariate logistic regression analysis, Gandhi Memorial Hospital, Addis Ababa, Ethiopia, June 2009 (n=408)

Variable	Number of Cases	Controls	Crude OR (95% CI)	Adjusted OR (95% CI)
Age of mother				
<18 years	9	5	3.90 (1.28, 11.89)	1.55 (0.17, 14.26)
18-34 years	120	260	1.00	1.00
>34 years	7	7	2.17 (0.74, 6.32)	3.44 (0.52, 22.64)
Educational level of mother				
No education	25	37	2.22 (1.10, 4.49)	0.46 (0.08, 2.64)
Elementary (Grade 1-6)	41	75	1.80 (0.97, 3.34)	0.97 (0.32, 2.98)
Junior (Grade 7-10)	48	90	1.75 (0.96, 3.20)	0.81 (0.30, 2.15)
>10th Grade	21	69	1.00	1.00
Mother's Occupation				
Student/Housewife/Unemployed	65	134	1.17 (0.74, 1.85)	1.58 (0.71, 3.51)
Government/Private/NGO/Self Employed	44	106	1.00	1.00
Unskilled labourer	20	23	2.09 (1.05, 4.20)	1.40 (0.34, 5.73)
Others	6	9	1.61 (0.54, 4.78)	3.10 (0.30, 32.35)
Family Income (Ethiopian Birr)				
<550	40	78	0.70 (0.11,4.57)	0.70 (0.11, 4.57)
550-1049	37	84	1.31 (0.57,2.97)	1.31 (0.57, 2.97)
≥1050	37	83	1.00	1.00
Birth-order of child (Parity)				
First	89	155	1.45 (0.94, 2.24)	1.90 (0.85, 4.23)
2nd-4th	45	114	1.00	1.00
>4th	1	3	0.84 (0.09, 8.33)	-
Gestational age				
Preterm (<37 weeks)	44	14	11.58 (5.91, 22.69)	**7.65 (2.79, 20.96)**
Term (≥37)	54	199	1.00	1.00
Weight of mother in the last month of pregnancy (kg)				
<60	31	54	2.17 (1.21, 3.86)	**2.31 (1.06, 5.05)**
≥60	35	132	1.00	1.00
ANC number of follow ups				
1-3	42	37	3.51 (2.10, 5.88)	**2.88 (1.14, 7.37)**
≥4	73	226		**1.00**
History of Hypertension during pregnancy				
Yes	38	30	3.47 (2.02, 5.93)	**3.89 (1.59, 9.55)**
No	87	238		1.00
History of vaginal bleeding during pregnancy				
Yes	21	24	1.93 (1.03, 3.61)	1.03 (0.30, 3.58)
No	112	247	1.00	1.00

6. DISCUSSION

This study revealed that maternal hypertension during pregnancy, maternal weight of less than 60 kg in the last month of pregnancy, preterm birth and under (one to three) attendance of prenatal care were found to be independently associated with LBW.

A number of caveats need to be noted regarding the present study. Despite the great deal of deliveries taking place in the hospital, the required sample size couldn't be attained even with extended period of data collection. The small sample size was in most instances responsible for the wide widths of some of the confidence intervals. However, during analysis many of the factors which were considered in the calculation of sample size have achieved a level of statistical significance; hence the deficit in the sample size might not have affected the validity of the study findings.

In Addis Ababa, a substantial proportion (21%) of women deliver at home and another 11% give birth in private health institutions (10). Hence, those delivering at government hospital may be different from women delivering at home or private institution in some important ways. This might limit the generalizability of the findings to Addis Ababa population but not its validity. Similar study on birth weight among home and private institution delivered babies is recommended.

Many of the exposure measurement methods were based on self report with the possibility of imperfect recall and misclassification. However, since all procedures were standardized and performed consistently, only non differential misclassification is likely, which may have attenuated measures of effect. Besides, maternal reports of pregnancy variables were shown to be highly correlated with clinically recorded measures (54).

Objective measurements of variables like caffeine consumption and hemoglobin level were not possible unlike some studies done abroad who managed to do so. Objective assessments are more likely to yield better results for such variables than maternal interviews. Moreover, for some study participants data were missing for variables like family income, weight during pregnancy and gestational age and thus were excluded from analysis. These might have biased the study results, though the direction of bias was not known.

Another potential limitation is the possibility of selection bias. However, in the present study the non-LBW infants originated from the same hospital as the LBW infants thus reducing the risk of selection bias.

Uniform inclusion and exclusion criteria were used in order to minimize bias. Unlike most of the previous studies conducted in Ethiopia which relied only on institutional records, face to face maternal interviews were the main method of data collection utilized in the present study. This has allowed for a detailed collection of data on various factors influencing birth weight and as well enabled control for important confounders through multivariate analysis.

Some studies have found that female babies were more likely to be LBW than males (14,21,28,38). This difference was not noticed in this study. Other researchers argue that sex does not influence birth weight (12,36).

Teenage mothers are well known for adverse pregnancy outcomes. However, in the present study even though the bi-variate analysis showed significant association between young maternal age (<18 years) and LBW, this finding was not supported by multiple logistic regression analysis. This is in contrast to many studies which found an independent association of younger maternal age with LBW (20,28,29). Other studies in Ethiopia and elsewhere found that maternal age had a statistically significant association with LBW only at the bi-variate level of analysis (15,19,21,

32-34,42). In adolescent childbearing, it has to be remembered that adolescent mothers usually come from disadvantaged groups of population. Therefore, the relationship between adolescent pregnancy and LBW might have been confounded by poverty and other social factors. Advanced maternal age (> 34 years) was shown to influence birth weight in studies done abroad (34-36). This was not shown in the present study. It could be because of the small number of mothers aged above 34 years that might have resulted in wide width of confidence limit.

Previous studies have shown that having LBW was more likely among currently not married women compared to currently married women (14,37,38). Effect of marital status on LBW was not observed in this study which could be attributable to small number of those mothers who were currently not married. In some studies in which other factors have been held constant, birth weight was not significantly different between the infants of married and unmarried women (21, 39).

Although maternal education had a statistically significant association with LBW at the bi-variate analysis this was not seen under multiple logistic regression analysis. Even if this result differs from some published studies (28, 32, 51), it is consistent with other studies that did not find any association of maternal education with LBW (28, 29).

In this study, mothers who were unskilled labourers were found to have more chance of LBW delivery at the bi-variate analysis. However, this association was not observed when adjustment was made for other factors. This might be attributed to the fact that women who are unskilled labourers are also likely to be under unfavorable socio-economic conditions and therefore, maternal occupation might have been confounded by other social factors.

An effect of paternal determinants of LBW has been analyzed in this study. In the present study, educational level and occupation of the father did not seem to affect birth weight. These findings are in line with a study in Germany which failed to identify paternal determinants of LBW (53).

The role of family income on LBW has been highlighted by previous research (40). This study's finding was not in agreement with the earlier finding. This difference might be explained by the fact that income is a sensitive issue in Ethiopia and its measurement through interview might not yield a true picture as some respondents perhaps over-report and some others under-report their income.

Short gestation (preterm birth) was a variable that had the highest independent association with LBW in the present study. This is in line with previous studies (20,33). This would not be surprising as it is a well known fact that the shorter the gestation, the smaller and the lighter the baby is.

Analysis of effect of weight during the last month of pregnancy yielded an independent effect on LBW. Delivering a LBW baby was more likely to occur in mothers weighing less than 60 kgs than mothers with weight of 60 and above. This finding corroborates the result of a study in another developing country where low maternal weight at booking (<60 kg) was found to be predictor of LBW. This result is also in line with results of two studies from India (29,34) which showed independent effect of post partum weight on LBW, and with another study in which pregnancy weights were taken (40).

WHO recommends a woman without complications to have at least four ANC visits so that it is possible during these visits to detect health problems associated with a pregnancy (49). In this study, ANC attendance was a variable that had a very strong protective association against LBW under bi-variate analysis. Other studies have also reported similar findings (12,14,21,43,46).

Moreover, in this study it was found that among those mothers attending ANC, number of ANC visits made was an independent factor influencing birth weight. This is also consistent with other study (12) and the recommendation of WHO (46). The variable ANC follow up was omitted from multiple logistic regression model, even though it was strongly associated with LBW in bi-variate analysis. ANC attendance (at least once) was very high among both cases (88%) and controls (98%). Detecting a difference between them would not be possible with such small sample size. Besides, adding ANC follow up to the model along with the number of ANC visits would create a problem of multi-collinearity.

WHO also recommends that the first visit of ANC should occur in the first trimester, around, or preferably before, week 12 of pregnancy (49). However, in this study no significant difference in occurrence of LBW was observed among pregnant mothers who began their first ANC visit in the first, second or third trimester.

Hypertension in pregnancy is not a single entity. It includes disorders such as gestational hypertension, pre-eclampsia, eclampsia, and chronic hypertension (46). This study produced results which corroborate the findings of a great deal of the previous studies done abroad which showed hypertension as an independent predictor of LBW (22,35,38,42,46). It has been explained that hypertension causes blood vessel stenosis in some pregnant women and results in LBW in infants (42).

In bi-variate analysis maternal history of vaginal bleeding was found to influence birth weight but multiple logistic regression analysis did not support this finding. This is in line with findings of other studies which found no association after adjusting for other risk factors (22,32).

In a previous study, maternal anemia during pregnancy was shown to influence birth weight (30). In contrast to this study, however, no evidence of association of anemia with LBW was detected

in the present study. This could be attributed to methodological differences in obtaining data. In this study, mothers were asked if they were informed by a health worker about the diagnosis of anemia during their recent pregnancy while the earlier study made objective measurement of hemoglobin/hematocrite level. Another possible explanation might be mothers in the study area do not usually realize the distinction between anemia and low blood pressure as these two terms overlap in local languages.

Maternal history of trauma during pregnancy was not found to be associated with LBW. Moreover, this study has been unable to demonstrate the association of LBW with diabetes mellitus as only few mothers (less than 1%) reported any history of diabetes.

Several studies have demonstrated domestic violence as an independent risk factor for LBW (13, 45, 52). However, this was not evident in the present study. This difference may be explained by the fact that mothers might be reluctant to reveal their husband's violent behavior in an interview, especially in the immediate time following delivery when they are likely to receive better care and love from their husbands that overlaps with the interview time. The other explanation might be domestic violence is considered as a normal event by some women and might not be recalled/recognized and reported.

Maternal obstetric history (gravidity/parity and abortion) is known to independently influence birth weight in some studies (22,27,28,30,50). In the present study, none of these were found to influence birth weight. Similarly, in this study LBW was not different among babies who were delivered through birth canal or cesarean section.

Studies have found that maternal caffeine consumption has a role in giving birth to LBW baby (18). In this study this was not observed. It could be because of lack of information on the amount, type of caffeine containing foods/drinks consumed. Methodological differences for

obtaining data: objective measurement using biochemical analyses versus history of caffeine consumption might also explain the difference. Another study in the United States argued that caffeine had no effect of on low birth weight (48).

Maternal alcohol consumption during pregnancy was indicated to influence birth weight (55). However, this was not evident in this study. This could be due to the lack of information on the amount and strength of the alcohol as well as the small number of mothers who reported using regularly.

Only small number of mothers reported smoking cigarettes, using shisha and chewing khat; which limit making meaningful comparison. Passive smoking also did not show association which might be explained with small number of mothers reporting passive smoking as well as lack of information on frequency and duration of exposure.

7. CONCLUSIONS

The present study was designed to identify determinants for LBW. One of the more significant findings to emerge from this study is that hypertension was found to be a predictor of LBW in the study area. It was also shown that maternal weight of less than 60kg during last month of pregnancy and under attendance of prenatal care (1-3 visits) resulted in higher occurrence of LBW. The importance of short gestation/preterm birth/ as a determinant of LBW was also clearly supported by the current finding.

8. RECOMMENDATIONS

Based on the findings of the study the following recommendations are forwarded:

- It is unfortunate that it is difficult to prevent hypertension from occurring during pregnancy. Screening pregnant mothers for hypertension in prenatal health care facilities coupled with proper management and its follow up may reduce the occurrence of low birth weight. To do this job, skilled staff and managers are needed in the health centres together with sufficient facilities.
- Efforts must be made to achieve full attendance of ANC by all pregnant mothers. For this to be realized effective health promotion programs need to be emphasized. In order to further develop an effective prevention strategy to reduce LBW, further studies are also needed to identify why some women do not or underutilize prenatal care.
- During ANC visits pregnant mothers need to be encouraged to achieve a weight of 60kg especially at third trimester of their pregnancy. In order to achieve this level further measure needs to be taken to improve nutritional status of women including during pre-pregnancy.
- Moreover, further study to identify risk factors for preterm births is suggested so that effective programs are designed to decrease preterm birth and LBW.

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ANNEX 1. INFORMED CONSENT SHEET

Good morning/afternoon, my name is _____ and I am a midwife/nurse working for this hospital. I am also part of a team carrying out a study on determinants of Low Birth Weight (LBW) in Addis Ababa.
Currently, we are conducting a study on factors that are responsible for low birthweight. We believe that the study findings will help in order to improve care for mothers and their newborns.

If you participate in the study, it will not take us more than 15 minutes. Your name will not be written on this form, thus the information you provide will not be known to others. Your participation is purely voluntary, and you can withdraw any time after you get involved in the study without compromising the services you ought to get from the hospital. However, we hope that you will participate in this study since your views are important.

Do you have any questions?

Now please tell me if you agree to participate in the interview.

The Participant:

1. Agreed ☐
2. Did not agree ☐ ⟶ End interview

Signature of interviewer which indicates that the respondent has consented to participate in the study:-
Interviewer Name: _____ Signature _____

|_____|_____| 2009
Date Month

Supervisor Name: _____ Signature _____

|_____|_____| 2009
Date Month

ANNEX 2. STRUCTURED QUESTIONNAIRE

Mother's code…… |_____|_____|_____|		Date |_____|_____| 2009	
Note: check the inclusion criteria: • *Is the child born alive?* • *Do the parents currently reside in Addis Ababa?* • *Is the baby born single?* *If "no" to any of the questions, thank the mother and stop interview.*			
Interviewer's Name _____		Interviewer's code …… |_____|_____|	
Time at beginning of interview ___:_____			
S. No.	Questions and filters	Coding categories	Skip
Section I. Newborn Characteristics			
101	Birth weight of the baby in grams? *Please review and fill from records.*	Birth weight in grams…….☐☐☐☐	
102	What is the sex of the newborn?	Male……....1 Female…….…….. 2	
Section II. Characteristics of Parents			
201	How old were you at your last birthday? AGE IN COMPLETED YEARS	Age in completed year……☐☐	
203	Have you ever attended school?	YES..... 1 NO..... 2 ⟶	205
204	What is the highest grade you completed?	Grade..... ☐☐ Tech./Voc. certificate ..... 13 University/College Diploma..... 14 University/College degree or higher…. 15	
205	What is your religion?	Orthodox ……. . . ….……1 Catholic . …….. . . . . … 2 Protestant . . . … ……. 3 Muslim . . …… ……4 Traditional……..…….. . . ……5 OTHER _____ 6 (SPECIFY)	
206	What is your occupation? That is, what kind of work you mainly do?	Farmer..…… …….. 1 Student..……2 Trader…… ……3 Housewife …… 4 Government employee …… 5 Private sector employee …… 6 Self employed …… 7 others_____8 (SPECIFY)	

207	What is your current marital status?	Single/never married…… … 1 ⟶ Married/living together. ……... 2 Divorced/separation..…….. 3 ⟶ widowed…….. 4 ⟶	212 212 212
208	Did your husband/partner ever attend school?	YES . . . . 1 NO . . . . 2 ⟶	 211
209	What was the highest grade he completed?	Grade. . . . . .…….. ☐☐ Tech./Voc. Certificate……..… 13 University/College Diploma. ……14 University/College Degree ……15 Don't know…… …98	
210	What is your husband's/partner's occupation? That is, what kind of work does he mainly do?	Farmer..…… …….. 1 Student..……2 Trader……3 Government employee …… …… 4 Private sector employee …… 5 Self employed …… 6 others_____7 (SPECIFY)	
211	How much is your average family income per month.	Monthly income …… ☐☐☐☐☐ Very good…… 00001 Very poor…… … 00002 I don't know…… 00003	
Section III. Past Obstetric history			
301	What is gravidity of the mother? *That is any pregnancy occurred.*	Gravidity…… ☐☐	
302	What is parity of the mother? *That is any delivery that passed 28 weeks of gestation.*	Parity…… ☐☐	
303	Did you ever have abortion? *That is record any pregnancy terminated before 28 weeks of gestation?*	Yes…… 1 No……..2 ⟶	 Section 4
304	How many abortions did you have?	Number of abortions ……. ☐☐	
Section 4.Current pregnancy history			
401	What was the Gestational age at delivery, in weeks? *Please calculate from last menstrual period of the mother.*	Gestational age at delivery in weeks…… ☐☐	
402	How did the mother give birth? *That is mode of delivery.*	Vaginal delivery……...……1 Cesarean section ……2	
403a	During this pregnancy did you ever been weighed?	Yes……1 No…….……2 ⟶	

403b	What was your weight in the last weight measurement taken?	Weight of the mother……..☐☐	
403c	How long before delivery was this weight taken? *Record in weeks.*	Weeks …….☐☐	
404	Did you see any health professional for antenatal care for this pregnancy?	Yes……1 No…….……2 ⟶	310
405	How many months pregnant were you when you first received antenatal care for this pregnancy?	MONTHS …….☐☐ DONOT KNOW…….98	
406	How many times did you receive antenatal care during this pregnancy?	NUMBER OF TIMES ……..……☐☐	
407	During this pregnancy, have you been told that you have hypertension?	Yes……..… ……. 1 No…… ……2 Do not remember…….…….. 8	
408	During this pregnancy, have you been told that you are anemic?	Yes……..… ……. 1 No…… ……2 Do not remember…….…… ..8	
409	Have you ever been told that you have diabetes mellitus?	Yes……..… …….1 No…… …… 2 ⟶	410
410	Did the diabetes newly appear during this pregnancy, or it pre-exists before the pregnancy?	Yes……..… …… .1 No…… ……2 Do not remember…….…….. 8	
411	During this pregnancy, did you have any vaginal bleeding? *That is before delivery*.	Yes……..… ……. 1 No…… ……2 Do not remember……..….. 8	
412	Did you have any history of trauma or injury, during the recent pregnancy period? *Probe for fall, car accident etc.*	Yes…….……1 No……..2 Do not remember…….. 8	

	Ask question number 413 for women married/ living together only by checking question number 207				
413	While you were pregnant did your partner ever do the following:-		Often	sometimes	
	a) Physical acted on you? e.g. Slap/beat/kick you, pull your hair, twist arms, threaten or attack with knife etc.	Yes 1 → No 2 ↓	1	2	
	b) Physically force you to have sexual intercourse with him even when you did not want to?	Yes 1 → No 2 ↓	1	2	
	c) Force you to perform any sexual acts you did not want to?	Yes 1 → No 2 ↓	1	2	
	d) Say or do something to humiliate you in front of others?	Yes 1 → No 2 ↓	1	2	
	e) Insult you or make feel bad about yourself?	Yes 1 → No 2	1	2	
Section V. Life-style/Personal habits during pregnancy					
501	During this pregnancy, did you take caffeine containing drinks/food (tea, coffee, pepsi/coca cola, chocolate cake)?	Yes…… ……. 1 No…… …… … 2 Do not remember…… ….. 8			503 → 503 →
502	How often did you take caffeine containing foods/drinks?	Daily……. 1 5-6 times per week ……..…… 2 3-4 times per week…… 3 2 times per week …… 4 1 times per week …….. 5 Once a month ……..…… 6 3-8 times during pregnancy ……. 7 1-2 times during pregnancy ……. 8			
503	During this pregnancy, did you take alcoholic drinks?	Yes…… ……. 1 No…… ……2 →			505

504	How often were you taking alcoholic drinks? One unit of alcohol means 1. One glass of beer, vine, tella, tej, bordie, or 2. One cup of arekie, gin, whisky etc.	Daily……. 1 5-6 times per week ……..…… 2 3-4 times per week…… 3 2 times per week …… 4 1 times per week ……. 5 Once a month ……..…… 6 3-8 times during pregnancy ……. 7 1-2 times during pregnancy ……. 8	
505	During this pregnancy, did you ever chew khat?	Yes……..… …… 1 No…… …… 2 →	507
		Do not remember…….. 8 →	507
506	How often were you chewing khat?	Daily……. 1 5-6 times per week ……..…… 2 3-4 times per week…… 3 2 times per week …… 4 1 times per week ……. 5 Once a month ……..…… 6 3-8 times during pregnancy ……. 7 1-2 times during pregnancy ……. 8	
507	During this pregnancy, did you ever smoke?	Yes…….…… .1 No……2 →	509
		Do not remember……..…….. 8 →	509
508	How often were you smoking?	Daily……. 1 5-6 times per week ……..…… 2 3-4 times per week…… 3 2 times per week …… 4 1 times per week ……. 5 Once a month ……..…… 6 3-8 times during pregnancy ……. 7 1-2 times during pregnancy ……. 8	
509	*Ask the question number 510 for women who are married/ living together only by checking question number 207*		
	Does your partner smoke cigarettes while you were pregnant?	Yes……..… ……. 1 No…… ……2 Do not remember…… ….. 8	
510	Is there any other one at home who smokes cigarettes?	Yes……..… ……. 1 No…… ……2 Do not remember…… ….. 8	
Thank you for your participation!		Time at the end of interview ____:___	

ANNEX 3 AMHARIC INFORMED CONSENT SHEET

የ ፈ ቃ ደ ኝ ነ ት ማ ረ ጋ ገ ጫ ቅ ጽ

ጤና ይ ስ ጥ ል ኝ ፡ ፡ ስ ሜ _____ ይ ባ ላ ል ፡ ፡ በ ዚ ህ ሆ ስ ፒ ታ ል ው ስ ጥ ነ ር ስ /አ ዋ ላ ጅ ነ ር ስ / በ መ ሆ ን እ ያ ገ ለ ገ ል ኩ ኝ ነ ው ፡ እ ን ዲ ሁ ም ክ ብ ደ ታ ቸ ው ዝ ቅ ተ ኛ ሆ ነ ው ስ ለ ሚ ወ ለ ዱ ህ ጻ ና ት ላ ይ ጥ ና ት ከ ሚ ያ ደ ር ጉ ቡ ድ ን ጋ ር በ መ ስ ራ ት ላ ይ እ ገ ኛ ለ ሁ ፡ ፡

በ አ ሁ ኑ ጊ ዜ ሕ ፃ ና ት በ ዝ ቅ ተ ኛ ክ ብ ደ ት የ ሚ ወ ለ ዱ በ ት ን ም ክ ን ያ ት ለ መ ለ የ ት ጥ ና ት እ ያ ደ ረ ግ ን ነ ው ፡ ለ ዚ ህ ም መ ረ ጃ በ ማ ሰ ባ ሰ ብ ላ ይ እ ን ገ ኛ ለ ን ፡ ፡ ይ ህ ጥ ና ት ህ ፃ ና ት በ ዝ ቅ ተ ኛ ክ ብ ደ ት የ ሚ ወ ለ ዱ በ ት ን ም ክ ን ያ ት በ መ ለ የ ት ፣ ለ እ ና ቶ ች ና ሕ ጻ ና ት የ ሚ ደ ረ ገ ውን እ ን ክ ብ ካ ቤ ለ ማ ሻ ሻ ል ይ ረ ዳ ል ተ ብ ሎ ይ ታ መ ና ል ፡ ፡ ስ ለ ዚ ህ በ ዚ ህ ጥ ና ት እ ን ዲ ሳ ተ ፉ እ ን ጋ ብ ዞ ታ ለ ን ፡ ፡

በ ጥ ና ቱ ተ ሳ ታ ፊ ከ ሆ ኑ ከ 10-15 ደ ቂ ቃ ይ ወ ስ ድ ቦ ታ ል ፡ ፡ የ እ ር ስ ዎ ስ ም በ ዚ ህ መ ጠ ይ ቅ ላ ይ አ ይ ሞ ላ ም ፡ ፡ ስ ለ ዚ ህ የ ሚ ሰ ጡ ት መ ረ ጃ ሁ ሉ ሚ ስ ጥ ራ ዊ ነ ቱ እ ጅ ግ የ ተ ጠ በ ቀ ይ ሆ ና ል ፡ ፡ ተ ሳ ት ፎ ዎ ሙ ሉ በ ሙ ሉ በ እ ር ስ ዎ ፈ ቃ ደ ኝ ነ ት ላ ይ ብ ቻ የ ተ መ ሰ ረ ተ ይ ሆ ና ል ፡ ፡ እ ን ዲ ሁ ም በ ፈ ለ ጉ ት ጊ ዜ ው ይ ይ ቱ ን ማ ቋ ረ ጥ ይ ች ላ ሉ ፡ ፡ ባ ለ መ ሳ ተ ፍ ዎ ወ ይ ም ው ይ ይ ቱ ን በ ማ ቋ ረ ጥ ዎ ከ ሆ ስ ፒ ታ ሉ የ ሚ ያ ገ ኙ ት አ ገ ል ግ ሎ ት አ ይ ጓ ደ ል ቦ ት ም ፡ ፡ ይ ሁ ን እ ን ጂ የ እ ር ስ ዎ ተ ሳ ት ፎ በ ጣ ም አ ስ ፈ ላ ጊ በ መ ሆ ኑ በ ጥ ና ቱ እ ን ደ ሚ ሳ ተ ፉ ተ ስ ፋ እ ና ደ ር ጋ ለ ን ፡ ፡

ስ ለ ጥ ና ቱ ጥ ያ ቄ ካ ለ ዎ ት?

በ ቃ ለ መ ጠ ይ ቁ ለ መ ሳ ተ ፍ ፈ ቃ ደ ኛ ነ ዎ ት?

በ ጥ ና ቱ ለ መ ሳ ተ ፍ ፡ -

1. ተ ስ ማ ም ተ ዋ ል ☐ 2. አ ል ተ ስ ማ ማ ም → ☐ እ ዚ ው ላ ይ አ ብ ቃ /ቂ

ተ ጠ ያ ቂ ዋ በ ቃ ለ መ ጠ ይ ቁ ለ መ ሳ ተ ፍ ፈ ቃ ደ ኛ መ ሆ ና ቸ ው ን የ ሚ ያ ሳ ይ የ ቃ ለ መ ጠ ይ ቅ አ ድ ራ ጊ ው ፡ -

ስ ም_____
ፊ ር ማ_____

|_____|_____| 2001 ዓ .ም.
ቀ ን ወ ር

የ ተ ቆ ጣ ጣ ሪ ው ስ ም _____
ፊ ር ማ_____

|_____|_____| 2001 ዓ .ም.
ቀ ን ወ ር

ANNEX 4 AMHARIC QUESTIONNAIRE

ማስታወሻ፡ ቃለ ምጠይቁን ከመጀመርዎ በፊት አስፈላጊ ማስፈርቶች ተሟልተዋልን? የሕፃኑ ቤተሰቦች የጣት ከአዲስ አበባ ነውን? ሕጻኑ ሲወለድ ሕይወት ነበረውን? ሕጻኑ ብቻውን ነው የተወለደው(መንታ ያልሆነ)?			
እናትየዋ የመጡበት ክፍለከተማ 1. ቦሌ 2. ነፋስ ስልክ ላፍቶ 3. ቂርቆስ 4. ልደታ 5. የካ 6. አዲስ ከተማ 7. ጉለሌ 8. አቃቂ ቃሊቲ 9.አራዳ 10.ኮለፌ ቀራኒዮ		የእናትየዋ ካርድ ቁጥር |_____|_____|_____|_____|	
ቃለ መጠየቁ የተጀመረበት ሰዓት ___:_____			
ተ.ቁ.	**ጥያቄዎች**	**የክፍፍል ኮድ**	**እለፍ/ፊ**
ክፍል 1. የህፃኑ ገፅታ			
101	ህጻኑ እንደተወለደ የነበረውክብደት ስንት ነበር? *ክብደት በግራም ከመዘገብ ላይ ይሞላ፡ ፡*	የህጻኑ ክብደት በግራም..☐☐☐☐	
102	የህጻኑ ጾታ ምንድን ነው?	ወንድ.....1 ሴት.....2	
ክፍል 2. የወላጆች ገጽታ			
201	የመጨረሻውየልደት ቀንዎን ሲያከብሩ ዕድሜዎ ስንት ነበር? *ይህምየእናትየዋ የተጠናቀቀውዕድሜ ማለት ነው።*	ዕድሜበተጠናቀቀ ዓመት.....☐☐	
202	ትምህርት ቤት ገብተውተምረዋልን?	አዎ ..... 1 የለም.....2 ⟶	204
203	ያጠናቀቁት የመጨረሻው የትምህርት ደረጃ ስንት ነው?	የትምህርት ደረጃ .....☐☐ የቴክኒክ/ሙያ ሰርተፊኬት.....13 የዩኒቨርስቲ/የኮሌጅ ዲፕሎማ.....14 የዩኒቨርስቲ/የኮሌጅ ዲግሪ ወይምከዚያ በላይ ..15	
204	ዓይማኖትዎ ምንድን ነው?	ኦርቶዶክስ ..... 1 ካቶሊክ .....2 ፕሮቴስታንት .....3 ሙስሊም.....4 የባህል .....5 ሌላ _____ 6 (ይገለፅ)	
205	አሁን ምን ዓይነት ሥራ ነውየሚሰሩት?	ግብርና ..... 1 ተማሪ ..... 2 ንግድ ..... 3 የቤት እመቤት ..... 4 የመንግስት ተቀጣሪ ..... 5 የግል ድርጅት ተቀጣሪ ..... 6 የራስ ስራ ..... 7 ሌላ _____8 ይገለጽ	

206	የጋብቻዎ ሁኔታ ምንድን ነው?	ያላገቡ.....1 ⟶ ያገቡ/አብረው ያሉ..... 2 የተለያዩ/የተፋቱ..... 3 ⟶ ባል የሞተባቸው..... 4 ⟶	210 210 210
207	ባለቤትዎ ትምህርት ቤት ገብተው ትምህርት ተምረዋልን?	አዎ .....1 የለም.....2 ⟶	209
208	ባለቤትዎ የመጨረሻው ያጠናቀቁት የትምህርት ደረጃ ስንት ነው?	የትምህርት ደረጃ ..... የቴክኒክ/ሙያ ሰርተፊኬት.....13 የዩኒቨርስቲ/የኮሌጅ ዲፕሎማ.....14 የዩኒቨርስቲ/የኮሌጅ ዲግሪ ወይም ከዚያ በላይ..15 አላውቅም.....98	
209	የባለቤትዎ ሥራ ወይም ሙያ ደርያ ምንድን ነው?	ግብርና ..... 1 ተማሪ ..... 2 ንግድ ..... 3 የመንግስት ተቀጣሪ ..... 4 የግል ድርጅት ተቀጣሪ ..... 5 የራስ ስራ ..... 6 ሌላ _____7 ይገለጽ	
210	የቤተሰብዎ አጠቃላይ ወርኃዊ ገቢ ምን ያህል ይሆናል? *በማውጣጣት የወር ገቢን ለመገመት ምክር/ሪ፡፡*	ወርሃዊ ገቢ ..... በጣም ጥሩ ..... 00001 በጣም አነስተኛ ..... 00002 አላውቅም..... 00003	

ክፍል 3. የእናትየዋ የእርግዝና/ውልደት ታሪክ

301	በአጠቃላይ ስንት ጊዜ አርግዘዋል?	የእርግዝና ብዛት.....	
302	ከ28 ሳምንታት ወይም ከሰባት ወር በላይ አልፈው የተወለዱ እርግዝናዎች ብዛት ስንት ናቸው?	28 ሳምንታት ያለፉ እርግዝናዎች..	
303	ውርጃ አጋጥምዎት ያውቃል? *28 ሳምንታት (7 ወራት) ሳይሞላው የተቋረጠ እርግዝና ጠይቅ/ቂ*	አዎ.....1 የለም.....2 ⟶	401
304	ውርጃ ስንት ጊዜ አጋጥምዎታል?	ውርጃ ብዛት.....	

ክፍል 4 የዚኛው እርግዝና ታሪክ

401	ህፃኑ የተወለደው በስንተኛው ሳምንት የእርግዝና ጊዜ ነበር? *በሳምንታት፣ የወር አበባ ለመጨረሻ ጊዜ ከመጣበት ጊዜ ይሰላ፡፡*	ህፃኑ የተወለደበት ሳምንታት..... አልታወቀም.....98	
402	ህፃኑ የተወለደውእንዴት ነበር?	ያለቀዶ ጥገና .....1 በቀዶ ጥገና 2	
403	a) በዚኛው እርግዝና ወቅት ክብደትዎን ተመዝነው ነበር?	አዎ.....1 የለም.....2 ⟶	404
	b) በእርግዝና ወቅት ለመጨረሻ ጊዜ የመዘኑት ክብደት ስንት ነበር?	የእናትየዋ ክብደት በኪሎግራም..... አላውቅም.....98 ⟶	404
	c) ይህን ክብደት ከተመዘኑ ምን ያህል ጊዜ ሆኖታል?	ጊዜ በሳምንታት	

	ከአንድ ሳምንት በታች ከሆነ "00" ይጻፍ፡ ፡		
404	በዚህ እርግዝና ወቅት ለቅድመወሊድ ክትትል የጤና ባለሙያን ጎብኝተውነበር?	አዎ ..... 1 የለም.....2 →	407
405	ለዚኛው እርግዝና፣ ለመጀመሪያ ጊዜ ቅድመ ወሊድ ክትትል የጀመሩት በስንተኛው የእርግዝና ወርዎ ነበር?	ወር ..... አላውቅም/አላስታውስም.....98 →	407
406	የቅድመ ወሊድ ክትትል ስንት ጊዜ ነበር የተከታተሉት?	የክትትል ብዛት	
407	በዚኛውእርግዝና ወቅት፣ የደምግፊት ወይምየደም ብዛት እንዳለቦት ተነግርዎትነበር?	አዎ .....1 የለም.....2 አላስታውስም.....8	
408	በዚኛውእርግዝና ወቅት፣ የደምማነስ እንዳለቦት ተነግርዎትነበር?	አዎ .....1 የለም.....2 አላስታውስም.....8	
409	የስኳር በሽታእንዳለቦት ተነግርዎት ያውቃል?	አዎ .....1 የለም..... 2 → 411 አላስታውስም.....8 → 411	
410	የስኳር በሽታው፣ በዚኛውየእርግዝና ወቅት አዲስ የተከሰተነበር?	አዎ .....1 የለም.....2 አላስታውስም.....8	
411	በዚኛው የእርግዝና ወቅት፣ ከወሊድ በፊት ከማዕፀን የሚፈስ ደምአጋጥምዎት ያውቃል?	አዎ .....1 የለም.....2 አላስታውስም.....8	
412	በዚኛው እርግዝና ወቅት፣ አደጋ ወይም ጉዳት አጋጥምዎት ያውቃል? *እንደ መኪና አደጋ፣ መውደቅ፣ ስብራት ወዘተ ካሉ አውጣጥ/ጨ፡ ፡*	አዎ .....1 የለም.....2 አላስታውስም.....8	
413	***ይህን ጥያቄ ከተራ ቁጥር 206 በማጣራት <u>ላገቡ/አብረው</u> ላሉ እናቶች ብቻ ጠይቅ/ቂ፡ ፡ ይህ ካልሆነ ወደ ክፍል 5 እለፍ/ፊ፡ ፡***		

በእርግዝናዎ ወቅት የእርስዎ የትዳር ጓደኛ/ባለቤት የሚከተሉት ነገሮች አድርጎቦትነበር?		ብዙ ጊዜ	አንድ አንድ ጊዜ
a) አካላዊ ጥቃት ማድረስ፣ ማለትም-ጥፊ፣ ድብደባ፣ ፀጉር መጎተት፣ እጅ መጠምዘዝ፣ በቢላዋ ማስፈራራት/መውጋት የመሰሰሉትን አድርሶቦት ያውቃል?	አዎ 1 → የለም 2 ↓	1	2
b) ለወሲብ እርስዎ ባይፈልጉምበኃይል ማስገደድ?	አዎ 1 → የለም 2 ↓	1	2
c) የማይፈልጉት/የማይመቾት የወሲብ አይነት እንዲፈጽሙ ማስገደድ?	አዎ 1 → የለም 2 ↓	1	2
d) ሰዎች ፊት የርስዎን ክብር በሚነካ መልኩ የሆነ ነገር	አዎ 1 →	1	2

	መናገር/ማድረግ?	የለም 2		
	e) ስለእራስዎ ጥሩ ነገር እንደይሰማዎ ማድረግና መሳደብ?	አዎ 1 → የለም 2	1	2

ክፍል 5 በእርግዝና ወቅት የነበሩ የእናትየዋ ሁኔታዎች

501	በዚኛውየእርግዝና ወቅት ካፌይን ፤ ማለትምእንደ ቡና፣ ኮካ ኮላ፣ ቴፕሲ ኮላ መጠጦችን ጠጥተው ፤ ወይምቾኮሌት ኬክ ተመግበውያውቃሉ?	አዎ.....1 የለም..... 2 → አላስታውስም.....8 →	 503 503
502	በዚኛው የእርግዝና ወቅት እነዚህን ካፌይን ያላቸውምግቦችን/መጠጦችን በምን ያህል ጊዜ ነበር የሚወስዱት፡ ፡	በየቀኑ ..... 1 በሳምንት 5-6 ጊዜ ..... 2 በሳምንት ከ3-4 ጊዜ .....3 በሳምንት 2 ጊዜ ..... 4 በሳምንት 1 ጊዜ ..... 5 በወር አንድ ጊዜ .....6 በእርግዝና ወቅት ከ3-8 ጊዜ ..... 7 በእርግዝና ወቅት ከ 1-2 ጊዜ 8	
503	በዚኛውእርግዝና ወቅት፣ አልኮል ያላቸውመጠጦች ጠጥተውያውቃሉ?	አዎ.....1 የለም.....2 → አላስታውስም.....8 →	 505 505
504	በዚህ እርግዝና ወቅት የአልኮል መጠጥ በየስንት ጊዜውጠጥተዋል? አንድመጠጥ የሚባለው a. አንድ ብርጭቆ ቢራ፣ ቪኖ፣ ጠላ፣ ጠጅ፣ ቦርዴ ወይም b. አንድ መለኪያ አረቄ፣ ጂን፣ ውስኪ፣ እና የመሳሰሉት ጠንካራ የአልኮል መጠጦች ናቸው፡ ፡	በየቀኑ ..... 1 በሳምንት 5-6 ጊዜ ..... 2 በሳምንት ከ3-4 ጊዜ ..... 3 በሳምንት 2 ጊዜ ..... 4 በሳምንት 1 ጊዜ ..... 5 በወር አንድ ጊዜ ..... 6 በእርግዝና ወቅት ከ3-8 ጊዜ ..... 7 በእርግዝና ወቅት ከ 1-2 ጊዜ 8	
505	በዚኛውየእርግዝና ወቅት፣ ጫት ቅመውያውቃሉ?	አዎ.....1 የለም..... 2 → አላስታውስም.....8 →	 507 507
506	በዚኛውየእርግዝና ወቅት፣ ጫት በየስንት ጊዜውነበር የሚቅሙት?	በየቀኑ ..... 1 በሳምንት 5-6 ጊዜ ..... 2 በሳምንት ከ3-4 ጊዜ ..... 3 በሳምንት 2 ጊዜ 4	

		በሳምንት 1 ጊዜ ..... 5 በወር አንድ ጊዜ ..... 6 በእርግዝና ወቅት ከ3-8 ጊዜ ..... 7 በእርግዝና ወቅት ከ 1-2 ጊዜ 8	
507	በዚኛው እርግዝና ወቅት፣ ሺሻ ስበው/አጨሰ ው/ያውቃሉ?	አዎ .....1 የለም..... .....2 → 509 አላስታውስ ም..... .....8 → 509	
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